MICROGRID SOLUTION

with Fronius Inverter and Victron Energy

1 Fronius Inverter
2 Victron inverter charger
3 Victron solar charge controller
4 Victron GX component

ALL THE ADVANTAGES AT A GLANCE:

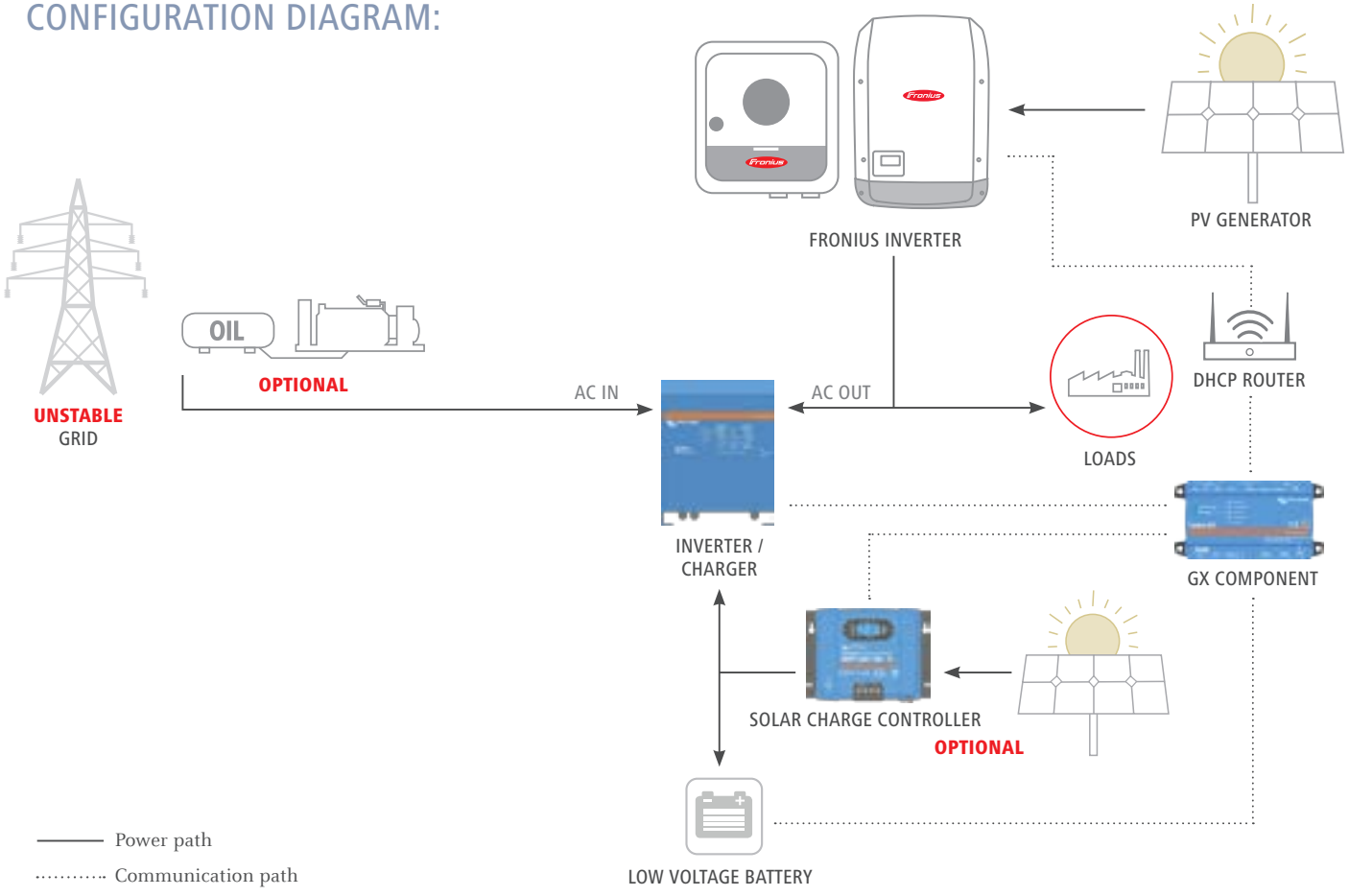
- Special setup ensures stable operation of the MicroGrid
- Verified and tested compatibility
- Automatic power reduction in case of a fully charged battery
- Possibility of zero feed-in
- Best support and service (joint training sessions and webinars)

WHAT ROLE DOES THE FRONIUS INVERTER PLAY IN THE MICROGRID SYSTEM?

“The AC coupling of the Fronius inverter in the MicroGrid is very important, as most of the energy is usually consumed during the day. In this case, the loads are supplied directly by the Fronius inverter and the highest levels of efficiency – over 98% – are achieved”

DAVID HANEK
MICROGRID EXPERT

CONFIGURATION DIAGRAM:



WHAT IS NEEDED TO IMPLEMENT THE MICROGRID SOLUTION?

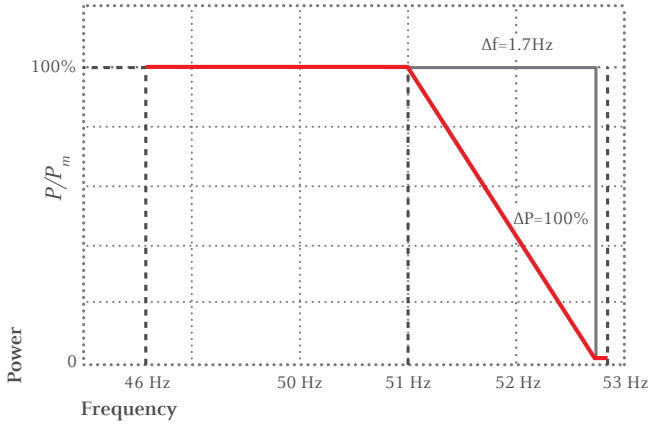
DEVICE	TYPE	NOTE
FRONIUS INVERTER	All Fronius SnapINverter (except Symo Hybrid) Fronius Primo Fronius Symo Fronius Eco Fronius Symo and Primo GEN24 & GEN24 Plus	The Fronius inverter must be installed at the **"AC OUT"** output of the Victron inverter/charger. In this way, the Fronius inverter continues to run during a mains power outage and allows the Fronius device to function seamlessly with the Victron equipment.
VICTRON INVERTER / CHARGER	Victron Quattro	/ 2 AC inputs (grid, backup generator) / Battery can be charged from the grid, generator and PV system / Robust inverter that can also provide starting currents in the MicroGrid / Automatic start/stop of the generator by integrated relay
	OR	
	Victron MultiPlus or MultiPlus II	/ 1 AC input (grid or generator) / Battery can be charged from the grid, generator and PV system / Robust inverter that can also provide starting currents in the MicroGrid / Automatic start/stop of the generator by integrated relay

DEVICE	TYPE	NOTE
VICTRON GX COMPONENT	Cerbo GX, ColorControl GX or other products from the GX series	Fronius inverters can be added to the GX component in the settings under “Fronius PV Inverters”.
LOW VOLTAGE BATTERY	12V/24V/48V Battery types: Lead (AGM, GEL or OPzV), lithium or other technologies such as redox-flow batteries	**Sizing of battery capacity for MicroGrid:** Lead battery (per 1 kWp of installed PV power) 100 Ah / 48 VDC 200 Ah / 24 VDC 400 Ah / 12 VDC Lithium battery (per 1.5 kWp of installed PV power) 100 Ah / 48 VDC 200 Ah / 24 VDC 400 Ah / 12 VDC A list of all compatible batteries can be found at:
VICTRON SOLAR CHARGE CONTROLLER OPTIONAL	SmartSolar- or BlueSolar series (12V/24V/36V/48V)	With Victron’s configurator it is possible to find the right solar charge controller for the MicroGrid:

WHAT NEEDS TO BE CONSIDERED WHEN IMPLEMENTING THE FRONIUS MICROGRID SOLUTION?

VICTRON COMMUNICATION

In stand-alone operation, the power of the inverter is controlled without communication and purely via the frequency droop characteristic of the Victron inverter/charger and the frequency-dependent power reduction of the Fronius inverter. This ensures maximum power retrieval from the Fronius inverters. Where a feed-in limitation is in force in grid-parallel operation, the Fronius inverter is controlled via Modbus communication via the GX component.



Frequency reduction function of Fronius inverters with a MicroGrid setup. Comprehensive range of settings for perfect coordination with the Victron inverter/charger.

For system monitoring, inverters that are equipped with a communication card (Datamanager or inverter integrated) communicate with the Victron GX component via WLAN or LAN using the Modbus TCP/JSON protocol.

VICTRON COMMUNICATION

The Victron products are all automatically recognized and visualized by the GX device. Communication between the products and GX device can be established as follows:

/ MultiPlus or Quattro via VE.Bus (RJ45 UTP cable)

/ SmartSolar MPPT via VE.Direct (all models - VE.Direct cable) or VE.Can (large models - RJ45 UTP cable)

/ CAN bus batteries via CAN bus cable (CAN bus BMS type A or B)

FRONIUS INVERTER SETUP

The Fronius inverter has a special MicroGrid setup (MG 50/ MG 60) with various functions that ensure stable operation of the MicroGrid. This can be set on the display of the Fronius inverter.

DIMENSIONING THE COMPONENTS

The maximum output power of the Fronius inverter must not exceed the maximum power of the Victron inverter/charger. Fronius specifies the AC output power in kW, whereas Victron specifies it in kVA.

The ratio of kW to kVA must always be 1:1!

Practical example:

Three Victron Quattro with an AC output power of 8 kVA each are connected in parallel (=24 kVA AC output power). This means that the total installed AC output power (PACmax) of the Fronius inverters must not exceed 24 kW.

MULTIPLE FRONIUS INVERTERS

If several SnapINverters are connected in the system, which need to be controlled for e.g. in regards of export limitation, they must be connected via the so-called Fronius Solar.Net ring. Connections from „IN“ to „OUT“ connector need to use a shielded cable (CAT5 or higher).

Feedback on the successful configuration of the Fronius Solar.Net ring can be obtained via the DATCOM status on the LCD screen. If several Fronius inverters have a Datamanager, the „master/slave“ position of the Datamanagers must be set correctly. Multiple GEN24 & GEN24 Plus inverters have to be connected via Modbus RTU (RS-485) in case of export limitation or external curtailment is required.

SYSTEM MONITORING

The system monitoring of the MicroGrid can be implemented via the Fronius Solar.web online tool or via the Victron VRM portal.

Detailed information on implementing the Fronius MicroGrid solution can also be found in our webinars:

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,660 employees worldwide and 1,321 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

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